Rehabilitation Engineering & Applied Research

Low Profile Tension Seat for Wheelchair Users who Propel with One or Both Feet

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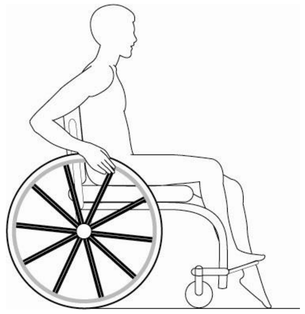
Problem

Wheelchair users who propel with one or both feet must be able to adequately reach the ground. Wheelchair cushions add to the seat surface height which can further hinder foot propulsion.

General design specifications:

- support the buttocks using a tension member
- attach directly to the wheelchair frame like traditional seat upholstery
- maintain folding capability



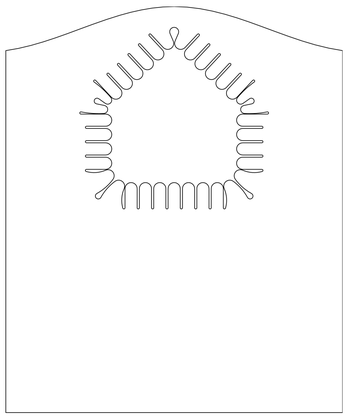
Sitting on a cushion can raise sitting height and make reaching the ground difficult

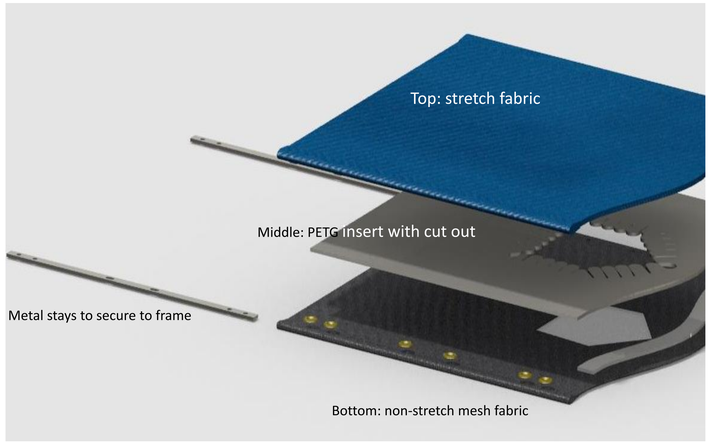
The Suspension Seat allows the person to sit lower to the ground for propulsion

Design

A simple support surface was designed to replace the wheelchair seat upholstery. Using a tension support and a thin, flexible support element.

Flexible support element has a cut-out - sized to pelvic anthropometry- and designed to allow tension member to support the buttocks





Prototype seat mounted to frame and folded

Evaluation

- Interface Pressure measurement to insure adequate pressure distribution
- User trials to evaluate impact on posture, comfort and maneuverability

Interface Pressure 15 subjects

Peak Pressure Index

79.85	Average
36.50	Min
153.25	Max

Remaining Design Challenges

Compatibility with wheelchair frames

Frames differ

- in width within each wheelchair size
- in the number and spacing of upholstery screws

Congruency with backrest upholstery to minimize gap

Technology Transfer:

The technology used in the suspension seat design was licensed by The Postureworks of Wellesley, MA

Acknowledgements

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SAVE THE DATE:

The mobilityRERC's State of the Science Conference will be held July 1 & 2 during Annual RESNA Conference